

Montana Fish, Wildlife & Parks

SPECIFICATIONS FOR WORK SPECIAL PROVISIONS

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1. PROJECT DESCRIPTION

The Project involves construction work associated with:

**Fox Lake Wildlife Management Area Dike Repair
Fish, Wildlife & Parks (FWP) Project # 7115317
Located in Richland County, MT**

The project includes gravel excavation, loading, transportation, placement and compaction of fill materials. Site preparation for fill materials, installation of culverts, sediment removal, seeding and best management practices.

Project Objective: Using fill material from nearby source, transport, place and compact fill on the dikes at locations as designated to improve integrity of dikes, install steel culvert crossing, and improve access to dikes using fill material as necessary. Remove sediment from the immediate area of water control structures and place removed material on dikes as directed by FWP Engineer. Seed all disturbed areas.

Scope of Work: Work includes the following but is not limited to the general description contained herein:

BASE BID ITEMS:

1. Mobilization
2. Excavation – Includes all unclassified excavation, rough grading, and compaction of in – place material.
3. Dike Repair (Sites A-G) – Includes all materials and labor to install 3” minus base course from material source indicated on Site Plan for dike repair areas as defined by Sites A-G. Cost of gravel material from designated material source to be paid by Owner.
4. Culvert Installation– Includes all materials and labor to install culverts into channel crossing. The fill material is included under Bid Item # 6. Culverts provided by Owner.
5. Sediment Removal – Includes all labor and material to remove sediment at the existing water control structures. Include all materials and labor to transport removed sediment and place.
6. Access Improvement - Includes all materials and labor to install 3” minus base course from material source indicated on Site Plan for road and dikes improvement to allow access for repair. Cost of gravel material from designated material source to be paid by Owner.
7. Seeding – Includes all labor and materials to seed areas disturbed during construction (not including Sites A-G) per plans and specifications.
8. Compaction Testing Allowance – The Contractor shall enlist the services of a materials testing service to verify compaction of imported materials. Upon completion of testing, the invoices from the testing service company shall be submitted to the Owner to reconcile with cost allowance.

2. PROJECT CONTACTS

Project contacts are designated as follows:

Owner:

Montana FWP
1420 E. Sixth Ave.
PO Box 200701
Helena, MT 59620-0701

FWP Project Representative:

Kevin McDonnell
FWP Project Manager
1522 9th Avenue
Helena, MT 59620
406-841-4010 (office)
406-431-1288 (cell)
406-841-4004 (fax)

3. SITE INSPECTION

All Bidders should satisfy themselves as to the construction conditions by personal examination of the site described in this document. Bidders are encouraged to make any - investigations necessary to assess the nature of the construction and the difficulties to be encountered, see General Conditions, Article 3.

4. SOILS INFORMATION

Geotechnical investigation work has been completed for this Project. It is the responsibility of the Bidders to review and interpret all investigations, findings, and reports made part of this contract prior to bid preparation, see General Conditions, Article 3.

5. PROJECT REPRESENTATIVE, INSPECTIONS, AND TESTING

The Contractor's work will be periodically tested and inspected to insure compliance with the Contract Documents. Complete payment will not be made until the Contractor has demonstrated that the work is complete and has been performed as required. If the Project Representative detects a discrepancy between the work and the requirements of the Contract Documents at any time, up to and including final inspection, such work will not be completely paid for until the Contractor has corrected the deficiency, see General Conditions, Article 9.

The Project Representative will periodically monitor the construction of work to determine if the work is being performed in accordance with the contract requirements. The Project Representative does not have the authority or means to control the Contractor's methods of construction. It is, therefore, the Contractor's responsibility to utilize all methods, equipment, personnel, and other means necessary to assure that the work is installed in compliance with the Drawings and Specifications, and laws and regulations applicable to the work. Any discrepancies noted shall be brought to the Contractor's attention, who shall immediately correct the discrepancy. Failure of the Project Representative to detect a

discrepancy will not relieve the Contractor of his ultimate responsibility to perform the work as required, see General Conditions, Article 3.

The Contractor shall inspect the work as it is being performed. Any deviation from the Contract requirements shall be immediately corrected. Prior to any scheduled inspection by the Project Representative, the Contractor shall again inspect the work and certify to the Project Representative that he has inspected the work and it meets the requirements of the Contract Documents. The work will be subject to review by the Project Representative. The results of all such inspections, and all contract administration, shall be directed to the Contractor only through the Project Representative.

5.1 Services Required by the Contractor. The Contractor shall provide the following services:

- a. Preparation and certification of all required shop drawings and submittals as described in the General Conditions, Article 3.gf
- b. All testing requiring the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the Project Representative. The laboratory shall be staffed with experienced technicians properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- c. Preparation and submittal of a construction schedule, including submittals, see General Conditions, Article 3. The schedule shall be updated as required, as defined in the Contract Documents.
- d. All Quality Control testing as required by the Contractor's internal policies.
- e. All Quality Assurance testing and/or re-testing as stated in the Contract Documents, see General Conditions, Article 13.

5.2 Services Provided by the Owner. The Owner shall provide the following services at no cost to the Contractor except as required for retests as defined in the Contract Documents.

- a. The Project Representative may check compaction of backfill and surfacing courses using laboratory testing submittal information supplied by the Contractor. These tests are to determine if compaction requirements are being fulfilled in accordance with the Contract Documents. It is ultimately the responsibility of the Contractor to insure that this level of compaction is constant and met in all locations.
- b. Any additional Quality Assurance testing deemed appropriate by the Owner, at the Owner's expense.
- c. Providing control elevation and coordinates for construction staking.

6. ENGINEERING INTERPRETATIONS

Timely Engineering decisions on construction activities or results have an important bearing on the Contractor's schedule. When engineering interpretation affects a plan design or specifications change, it should be realized that more than 24 hours may be required to gain the necessary Owner participation in the decision process including time for formal work directive, or change order preparation as required.

7. REJECTED WORK

Any defective work or nonconforming materials or equipment that may be discovered at any time prior to the expiration of the warranty period, shall be removed and replaced with work or materials conforming to the provisions of the Contract Documents, see General Conditions, Article 12. Failure on the part of the Project Representative to condemn or reject bad or inferior work, or to note nonconforming materials or equipment on the Contractors submittals, shall not be construed to imply acceptance of such work. The Owner shall reserve and retain all its rights and remedies at law against the Contractor and its Surety for correction of any and all latent defects discovered after the guarantee period (MCA 27-2-208).

Only the Project Representative will have the authority to reject work which does not conform to the Contract Documents.

8. UTILITIES

The exact locations of existing utilities that may conflict with the work are not precisely known. It shall be the Contractor's responsibility to contact the owners of the respective utilities and arrange for field location services. **One Call Locators, 1-800-424-5555**

8.1 Notification. The Contractor shall contact, in writing, all public and private utility companies that may have utilities encountered during excavation. The notification includes the following information:

- a. The nature of the work that the Contractor will be performing.
- b. The time, date and location that the Contractor will be performing work that may conflict with the utility.
- c. The nature of work that the utility will be required to perform such as moving a power pole, supporting a pole or underground cable, etc.
- d. Requests for field location and identification of utilities.

A copy of the letter of notification shall be provided to the Project Representative. During the course of construction, the Contractor shall keep the utility companies notified of any change in schedule, or nature of work that differs from the original notification.

- 8.2 Identification. All utilities that may conflict with the work shall be the Contractor's responsibility to locate before any excavation is performed. Field markings provided by the utility companies shall be preserved by the Contractor until actual excavation commences.
- 8.3 Removal or Relocation of Utilities. All electric power, street lighting, gas, telephone, and television utilities that require relocation will be the responsibility of the utility owner. A request for extending the specified contract time will be considered if utility owners cause delays.
- 8.4 Public Utilities. Water, sewer, storm drainage, and other utilities owned and operated by the public entities shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All such work shall be in accordance with these Contract Documents, or the Owner's Standard Specifications or written instructions when the work involved is not covered by these Specifications.
- 8.5 Other Utilities. Utilities owned and operated by private individuals, railroads, school districts, associations, or other entities not covered in these Special Provisions shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All work shall be in accordance with the utility owner's directions, or by methods recognized as being the standard of the industry when directions are not given by the owner of the utility.
- 8.6 Damage to Utilities and Private Property. The Contractor shall protect all utilities and private property and shall be solely responsible for any damage resulting from his construction activities. The Contractor shall hold the Owner and Project Representative harmless from all actions resulting from his failure to properly protect utilities and private property. All damage to utilities shall be repaired at the Contractor's expense to the full satisfaction of the owner of the damaged utility or property. The Contractor shall provide the Owner with a letter from the owner of the damaged utility or property stating that it has been repaired to the utility owner's full satisfaction.
- 8.7 Structures. The Contractor shall exercise every precaution to prevent damage to existing buildings or structures in the vicinity of his work. In the event of such damages, he shall repair them to the satisfaction of the owner of the damaged structure at no cost to the Owner.
- 8.8 Overhead Utilities. The Contractor shall use extreme caution to avoid a conflict, contact, or damage to overhead utilities, such as power lines, streetlights, telephone lines, television lines, poles, or other appurtenances during the course of construction of this project.

- 8.9 Buried Gas Lines. The Contractor shall provide some means of overhead support for buried gas lines exposed during trenching to prevent rupture in case of trench caving.
- 8.11 Survey Markers and Monuments. The Contractor shall use every care and precaution to protect and not disturb any survey marker or monuments, such as those that might be located at lot or block corners, property pins, intersection of street monuments or addition line demarcation. Such protection includes markings with flagged high lath and close supervision. No monuments shall be disturbed without prior approval of the Project Representative. Any survey marker or monument disturbed by the Contractor during the construction of the project shall be replaced at no cost to the Owner by a licensed land surveyor.
- 8.12 Temporary Utilities. The Contractor shall provide all temporary electrical, lighting, telephone, heating, cooling, ventilating, water, sanitary, fire protection, and other utilities and services necessary for the performance of the work. All fees, charges, and other costs associated therewith shall be paid for by the Contractor.

9. CONSTRUCTION SAFETY

The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees and subcontractors) and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve them from compliance with the obligations and penalties set forth therein, see General Conditions, Article 10.

10. CONSTRUCTION LIMITS AND AREAS OF DISTURBANCE

- 10.1 Construction Limits. Where construction easements or property lines, are not specifically called out on the Contract Documents, limit the construction disturbance to ten (10) feet, when measured from the edge of the slope stake grading, or to the adjacent property line, whichever is less. Disturbance and equipment access beyond this limit is not allowed without the written approval of both the Project Representative and the Owner of the affected property. If so approved, disturbance beyond construction limits shall meet all requirements imposed by the landowner; this includes existing roads used and/or improved as well as the construction of new access roads. Special construction, reclamation, or post-construction reclamation or other closure provisions required by the landowner on access roads beyond the

construction limits shall be performed by the Contractor at no additional cost to the Owner.

- 10.2 Areas of Disturbances. Approved areas of disturbance are those areas disturbed by construction activities within the construction limits and along designated or approved access routes. Such areas may require reclamation and revegetation operations, including grading to the original contours, top soiling with salvaged or imported topsoil, seeding, fertilizing, and mulching as specified herein. Other areas that are disturbed by the Contractor's activities outside of the limits noted above will be considered as site damage or unapproved areas of disturbance, see General Conditions, Articles 3 and 10. This includes areas selected by the Contractor outside the defined construction limits for mobilization, offices, equipment, or material storage.

11. DECONTAMINATE CONSTRUCTION EQUIPMENT

Power wash all construction equipment entering the project site to prevent the spread of noxious weeds and aquatic invasive species. This applies to all FWP projects, whether or not individual construction permits specifically address cleaning of equipment.

12. CONSTRUCTION SURVEYS

Existing survey control (horizontal and vertical) has been set for use in the design and ultimately the construction of these improvements. A listing of the coordinates and vertical elevation for each of these control points may be included in the project drawings.

The Contractor will be responsible for preserving and protecting the survey control until proper referencing by the Contractor has been completed. Any survey control obliterated, removed, or otherwise lost during construction will be replaced at the Contractor's expense.

Contractor shall be aware of property pins and survey monuments. Damage to these pins will require replacement of such by a registered land surveyor at no cost to the owner.

The Owner will provide the following construction staking

1. Slope stakes located at critical points as determined by the Project Representative.
2. Location and grade stakes for fill materials.
3. Location stakes for sediment removal, and misc. items as determined by the Project Representative.

13. MATERIAL SOURCES AND CONSTRUCTION WATER

The fill material source has been determined by FWP. Water used for compaction may be obtained onsite at the approval of FWP Engineer.

14. MATERIALS SALVAGE AND DISPOSAL

Notify the Owner for any material salvaged from the project site not identified in the Contract Documents. The Owner reserves the right to maintain salvaged material at the project site, compensate the Contractor for relocation of salvaged material, or agreed compensation to Owner for material salvaged by the Contractor.

Haul and waste all waste material to a legal site and obey all state, county, and local disposal restrictions and regulations.

15. STORED MATERIALS

Contractor shall use an approved storage area for materials. Materials and/or equipment purchased by the Contractor may be compensated on a monthly basis. For compensation, provide the Project Representative invoices for said materials, shop drawings and/or submittals for approval, and applicable insurance coverage, see General Conditions, Article 9.

16. STAGING AND STOCKPILING AREA

Contractor shall use staging and stockpiling sites to facilitate the project as approved by the Owner. Contract Documents may show approved staging and stockpiling locations. Notify Owner within 24 hours for approval of staging and stockpiling sites not shown on the Contract Drawings.

17. SECURITY

The Contractor shall provide all security measures necessary to assure the protection of equipment, materials in storage, completed work, and the project in general.

18. CLEANUP

Cleanup for each item of work shall be fully completed and accepted before the item is considered final. If the Contractor fails to perform cleanup within a timely manner the Owner reserves the right to withhold final payment.

Review these Contract Documents for additional Final Cleanup specifications for specific measures, associated with Contractor responsibilities and final payment.

19. ACCESS DURING CONSTRUCTION

Provide emergency access at all times within the project throughout the construction period.

20. CONSTRUCTION TRAFFIC CONTROL

The Contractor is responsible for providing safe construction and work zones within the project limits by implementing the rules, regulations, and practices of the Manual on Uniform Traffic Control Devices, current edition.

21. SANITARY FACILITIES.

The Contractor is responsible for providing safe sanitary facilities for the contractors personnel.

22. CONTRACT CLOSEOUT

The Contractor's Superintendent shall maintain at the project site, a "Record Set of Drawings" showing field changes, as-built elevations, unusual conditions encountered during construction, and such other data as required to provide the Owner with an accurate "as constructed" set of record drawings. The Contractor shall furnish the "Record Set" to the Project Representative following the Final Inspection of the Project. The Project Representative will provide a plan set for the use of the Contractor in recording project details.

The Contractor's final payment will not be processed until the "Record Set" of drawings are received and approved by the Project Representative.

23. MEASUREMENT AND PAYMENT

Review these Contract Documents for additional Measurement and Payment specifications for definitions. Quantities are listed on the Bid Proposal for Payment Items. Additional material quantities, volumes, and measurements may be shown on the Contract Document drawings and/or specifications.

Unit Price quantities and measurements shown on the Bid Proposal are for bidding and contract purpose only. Quantities and measurements supplied, completed for the project, and verified by the Project Representative shall determine payment. Each unit price will be deemed to include an amount considered by the Contractor to be adequate to cover Contractor's overhead and profit for each bid item.

Lump sum bid item quantities will not be measured. Payment for these lump sum bid proposal items will be paid in full amount listed on the Bid Proposal when accepted by the Project Representative, unless specified otherwise.

TECHNICAL SPECIFICATIONS

INDEX TO
TECHNICAL SPECIFICATIONS
FOX LAKE WILDLIFE MANAGEMENT AREA DIKE REPAIR

FWP# 7115317

DIVISION 2 SITE WORK

Section 01400 - Quality Control
Section 01410 - Testing Laboratory Services
Section 02110 - Site Clearing & Grubbing
Section 02207 - Aggregate Material
Section 02211 - Rough Grading
Section 02231 - Aggregate Courses
Section 02936 - Seeding

PLAN SHEETS

Sheet 1 - Cover
Sheet 2 - Overall Site Plan
Sheet 3 - Site A Plan and Profile
Sheet 4 - Site A Cross Sections
Sheet 5 - Channel Crossing Details

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References
- C. Inspection and testing laboratory services.

1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.3 REFERENCES

- A. Conform to reference standard by date of issue current on January 1, 2005.
- B. Should specified reference standards conflict with Contract Documents, or Regulations request clarification for Architect/Engineer before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 INSPECTION AND TESTING LABORATORY SERVICES

- A. Contractor will appoint, employ, and pay for services of an independent firm to perform inspection and testing.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Architect/Engineer.
- C. Reports will be submitted by the independent firm to the Architect/Engineer, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- D. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect/Engineer. Payment for retesting will be charged to the Contractor.
- E. The Contractor shall deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- F. The Contractor shall cooperate with laboratory personnel, and provide access to the work.
- G. The Contractor shall provide incidental labor tools and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- H. The Contractor shall notify Architect/Engineer and laboratory 48 hours prior to expected time for operations requiring inspection and testing services.
- I. The Contractor may arrange with laboratory and pay for additional samples and tests desired by Contractor beyond specified requirements.

OWNER

- A. The FWP Engineer will perform periodic field inspections to verify the results of the compaction testing.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A Selection and payment.
- B Contractor submittals.
- C Laboratory responsibilities.
- D Laboratory reports.
- E Limits on testing laboratory authority.
- E Contractor responsibilities.
- F Schedule of inspections and tests.

1.2 REFERENCES

- A. ANSI/ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.3 SELECTION AND PAYMENT

- A. The Contractor shall employ the services of an independent testing laboratory to perform specified inspection and testing. The testing agency will be approved by the FWP Engineer prior to testing.
- B. Employment of testing laboratory shall in no way relive Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.4 QUALITY ASSURANCE

- A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740.
- B. Laboratory: Authorized to operate in state in which Project is located.

- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.5 CONTRACTOR SUBMITTALS

- A. Prior to testing, submit testing laboratory name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards (NBS) during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.6 LABORATORY RESPONSIBILITIES

- A. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.
- B. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- C. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

1.7 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Architect/Engineer, and to Contractor.
- B. Include:
 - 1. Date issued,
 - 2. Project title and number,
 - 3. Name of inspector,
 - 4. Date and time of sampling or inspection,
 - 5. Identification of product and Specifications Section,
 - 6. Location in the Project,
 - 7. Type of inspection or test,
 - 8. Date of test,
 - 9. Results of tests,
 - 10. Conformance with Contract Documents.

- C. Provide interpretation of test results to Engineer.

1.8 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

1.9 CONTRACTOR RESPONSIBILITIES

- A. Contract with an appropriate testing agency and make arrangements with the testing agency to perform the tests required in the contract documents.

END OF SECTION

SECTION 02110

SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Remove surface debris.
- B. Clear only areas designated for construction of plant life and grass.
- C. Tree and shrub removal.
- D. Topsoil excavation.
- E. Measurement and Payment

1.2 REGULATORY REQUIREMENTS

- A. Conform to State and County codes for disposal of debris and burning debris on site.
- B. Coordinate clearing Work with utility companies.

PART II EXECUTION

1.1 PROTECTION

- A. Locate, identify, and protect utilities that remain, from damage.
- B. Protect trees, plant growth, and features designated to remain, as final landscaping.

1.2 CLEARING

- A. Clear areas required for access to site and execution of Work.
- B. Remove root system of woody plants to a depth of 24 inches below finished grade.
- C. Clear undergrowth and deadwood, without disturbing subsoil.

1.3 REMOVAL

- A. Remove extra top soil, rock, and extracted plant life to designated area.
- B. Dispose of any additional material according to local regulations.

1.4 TOPSOIL EXCAVATION

- A. Excavate and stockpile topsoil from all areas that are to receive fill or further excavation.
- B. Stockpile location to be approved by Engineer.

1.5 MEASUREMENT AND PAYMENT

- A. The work described in Section 02110 will be incidental to the Excavation. See Item #2 on the Bid Proposal Form.

END OF SECTION

SECTION 02207

AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References
- B. Stockpiling
- C. Stockpile clean up

1.2 RELATED SECTIONS

- A. Section 02211 - Rough Grading.
- B. Section 02231 - Aggregate Courses.

1.3 REFERENCES

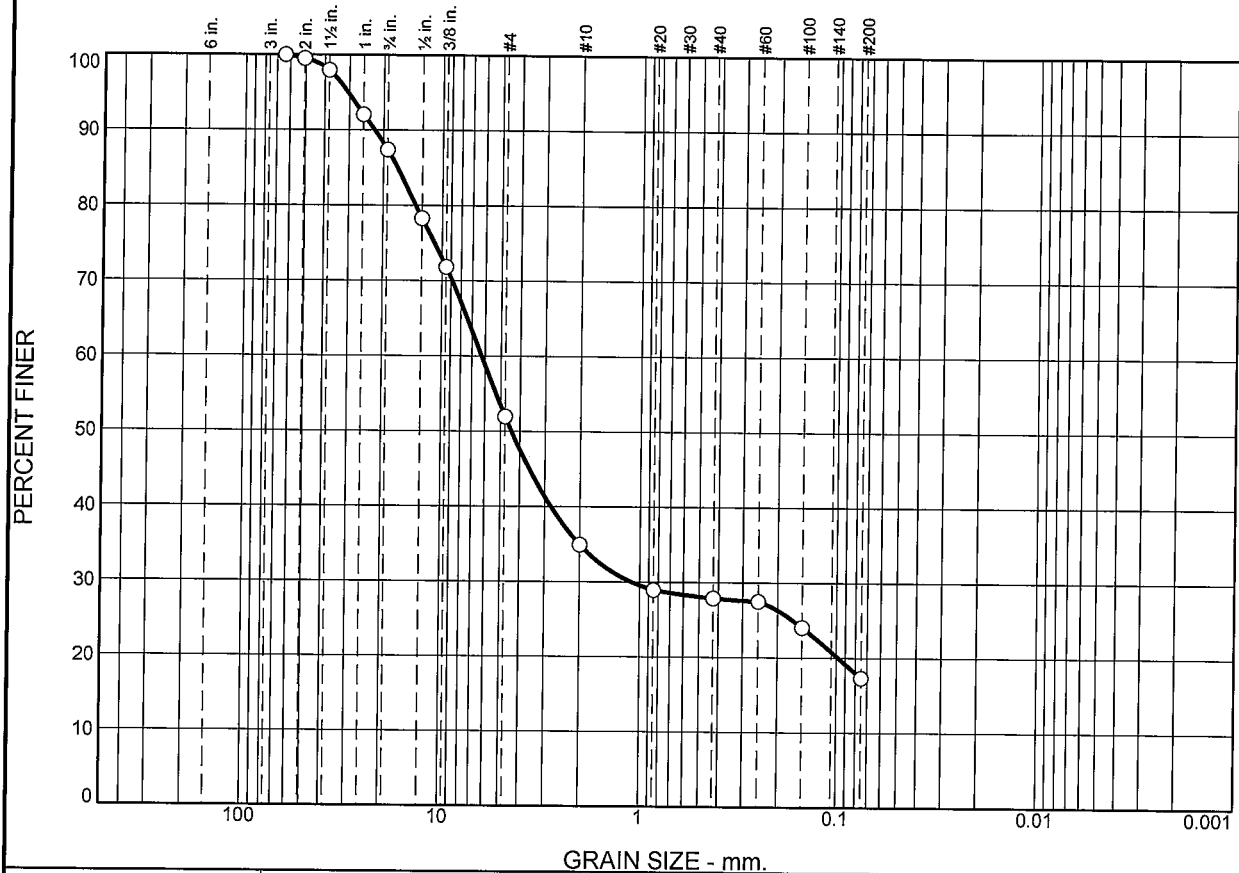
- A. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate.
- B. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- C. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

Material Testing Report –

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	13	35	17	7	11	17	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100		
2	99		
1.5	98		
1	92		
.75	87		
.5	78		
.375	72		
#4	52		
#10	35		
#20	29		
#40	28		
#60	27		
#100	24		
#200	17		

* (no specification provided)

Material Description
Silty gravel with sand (ASTM D2487)

Atterberg Limits
PL= NP LL= NV PI= NP

Coefficients
D₉₀= 22.2116 D₈₅= 16.9572 D₆₀= 6.2580
D₅₀= 4.4122 D₃₀= 1.1065 D₁₅=
D₁₀= C_u= C_c=

Classification
USCS= GM AASHTO= A-1-b

Remarks

Location: Murray Pit
Sample Number: 14343

Date: 07-15-13

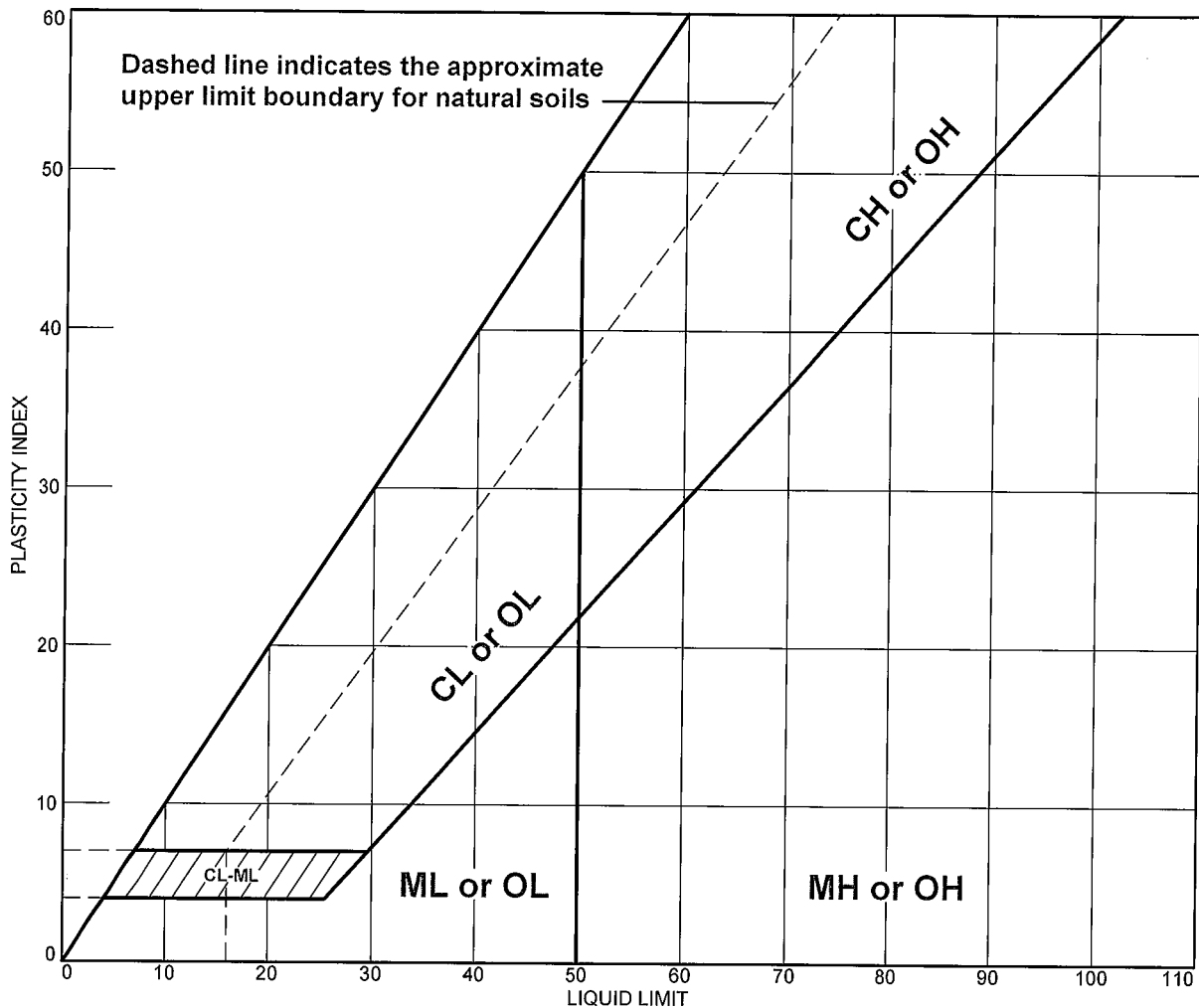


Client: Montana Fish Wildlife & Parks
Project: Fox Lake WMA Dike Repair

Project No: 1301068

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
•	Silty gravel with sand (ASTM D2487)	NV	NP	NP	28	17	GM

Project No. 1301068 **Client:** Montana Fish Wildlife & Parks

Project: Fox Lake WMA Dike Repair

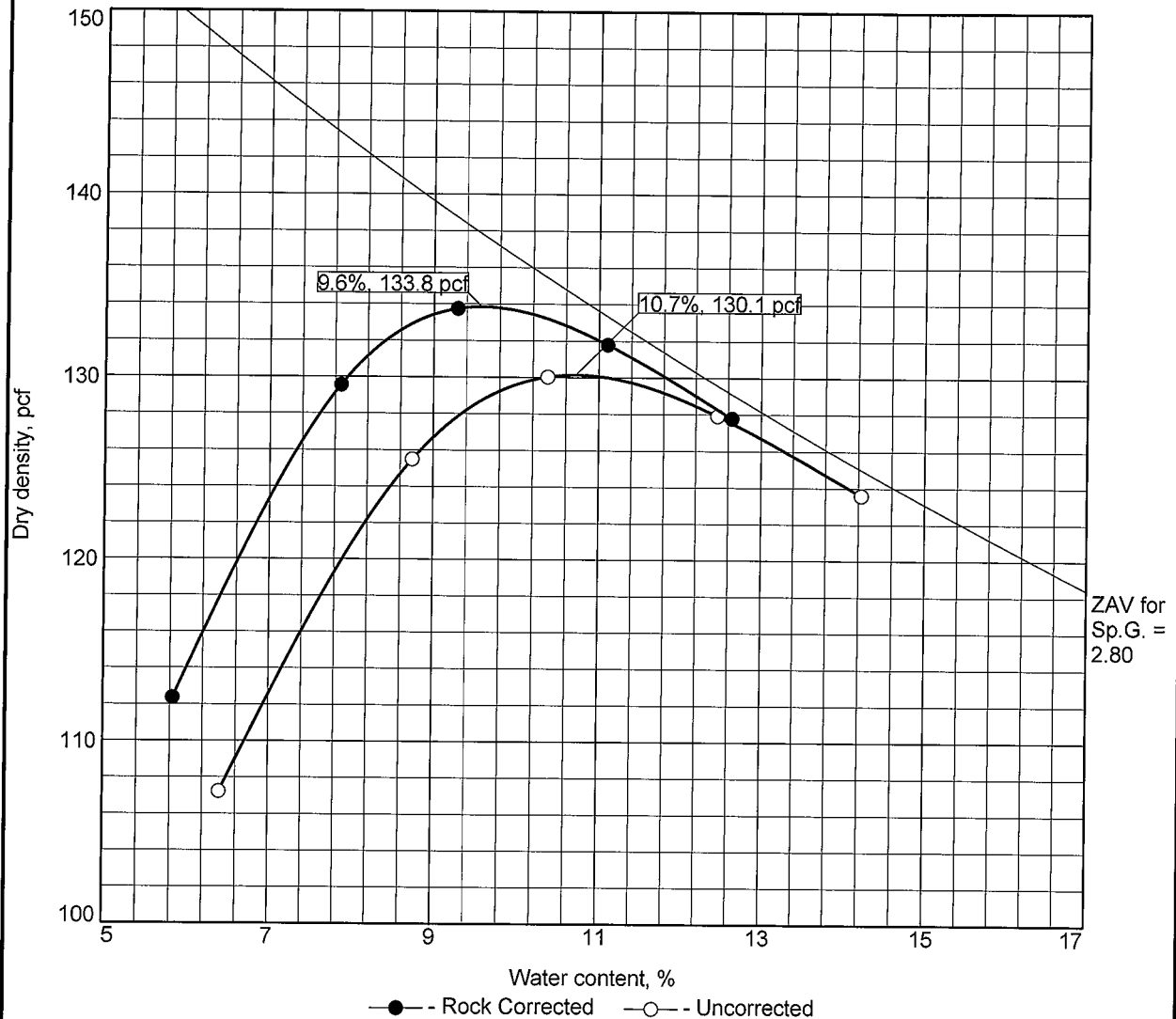
• **Location:** Murray Pit **Sample Number:** 14343

Remarks:



Figure


COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method C Standard
 ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	GM	A-1-b			NV	NP	13	17

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 133.8 pcf	130.1 pcf	Silty gravel with sand (ASTM D2487)
Optimum moisture = 9.6 %	10.7 %	

Project No. 1301068 Client: Montana Fish Wildlife & Parks Project: Fox Lake WMA Dike Repair Location: Murray Pit Sample Number: 14343	Remarks:
	

Figure

PART 3 EXECUTION

3.1 STOCKPILING

- A. Stockpile materials on site at locations approved by Engineer.
- B. Separate differing materials with dividers or stockpile apart to prevent mixing.
- C. Stockpile in sufficient quantities to meet project schedule and requirements.
- D. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in a clean, neat condition reseed as necessary. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 02211

ROUGH GRADING

PART 1 GENERAL

1.1 SECTION INCLUDE

- A. Removal of topsoil and subsoil.
- B. Excavating, grading, filling and rough contouring the dikes to receive fill material.
- C. Measurement and Payment

1.2 RELATED SECTIONS

- A. Section 01410 - Testing Laboratory Services: Testing fill compaction.
- B. Section 02110 - Site Clearing
- C. Section 02207 - Aggregate Materials.

1.3 REFERENCES

- A. AASHTO T180 - Moisture-Density Relations of Soils using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

PART 2 EXECUTION

2.1 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Notify utility companies to locate buried utilities.
- D. Locate, identify, and protect utilities that remain from damage.

2.2 TOPSOIL AND SUBSOIL EXCAVATION

- A. Excavate topsoil and subsoil from marked areas.
- B. Stockpile topsoil in area approved by Engineer.
- C. Topsoil will be blended into landscape and seeded, or used for reclamation on site.

See Section 02936

2.3 FILLING

- A. Fill areas to contours and elevations with unfrozen materials.
- B. Place fill materials on continuous layers and compact. See Section 02231
- C. Maintain optimum moisture content of fill materials to attain required compaction density.
- D. Make grade changes gradual. Blend slope into level areas.

2.4 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed as necessary by the Engineer.
- B. Compaction testing will be performed in accordance with ASTM D2922.
- C. Placement of fill material shall not commence until Engineer has been notified and has had 48 hours to inspect rough grading.

2.4 MEASUREMENT AND PAYMENT

- A. The Rough Grading described in Section 02211 shall be included under Excavation Bid Item #2 on the Bid Form.

END OF SECTION

SECTION 02231

AGGREGATE COURSES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aggregate courses.

1.2 RELATED SECTIONS

- A. Section 01025 - Measurement and Payment: Requirements applicable to lump sum.

1.3 REFERENCES

- A. AASHTO T180 - Moisture-Density Relations of Soils using a 10lb (4.54 kg) Rammer and an 18 in. (457mm) Drop.
- B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 PRODUCTS

2.1 MATERIALS

- A. 3 inch minus pit run: See the Material Testing Report Section under Section 02207 Aggregate Materials, Part 2 Materials..

PART 3 EXECUTION

3.1 AGGREGATE PLACEMENT

- A. Spread material over prepared substrate to a maximum lift of 8 inches. A vibratory roller is suggested for compaction.
- B. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content. Compact aggregate materials and sub-grade to

minimum 90 percent of maximum density.

- C. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.2 TOLERANCES

- A. Flatness: Maximum variation of 1/10 foot in 10 feet measured along existing slope.
- B. Scheduled Compacted Thickness: Within 1/4 inch of designated thickness.

3.3 FIELD QUALITY CONTROL

- A. Contractor will be responsible for field quality control. FWP Engineer will inspect all work and verify compaction testing.
- B. Compaction testing will be performed in accordance with ASTM D2922.
- B. If tests indicate Work does not meet specified requirements, recompact and retest or at Engineer's discretion, remove Work, replace and retest.

3.4 MEASUREMENT AND PAYMENT

- A. All material and labor described in this section shall be bid and compensated under the appropriate bid item; Dike Repair Bid Item # 3, Access Improvement Bid Item #6, or under the Compaction Testing Allowance Bid Item #8. Cost of gravel material from designated material source to be paid by Owner.
- B. Material volumes will be estimated on a per load basis. Average load quantities will be established at the initiation of the project with the FWP Engineer, and verified by source area measurements. The FWP Engineer will verify the material quantities by pre and post topographic survey of the material source area. Compensation will be made on the volumes of material removed from the source area.

END OF SECTION

SECTION 02936

SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Measurement and Payment
- B. Quality assurance
- C. Delivery storage and handling of seed and fertilizer
- D. Seed mixture
- E. Soil materials
- F. Fertilizer
- G. Examination of soil base
- H. Substrate preparation
- I. Placing topsoil
- J. Fertilizing
- K. Seeding
- L. Maintenance

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Grassed Areas:
 - 1. Basis of Measurement: Not measured. Lump Sum. See Bid Item #8 on the Bid Form.
 - 2. Basis of Payment: Lump Sum. Includes preparation of topsoil and seeding.
 - 3. Seed and Fertilize all areas disturbed by construction.

1.3 REFERENCES

- A. FS O-F-241 - Fertilizers, Mixed, Commercial.

1.4 DEFINITIONS

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Knapweed, Horsetail, Morning Glory, Rush Grass, Mustard, Leafy Spurge, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel and Brome Grass.

1.5 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of pure live seed, seed mix, year of production, net weight, date of packaging, and location of packaging.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products such that they are stored in a weatherproof, dry, rodent free location in such a manner that it will not be damaged or its usefulness impaired.
- B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.7 SEED MIXTURE (By Weight)

A. Seed mix #1:	PLS/Acre (lbs)	% By Weight	PLS/Acre (lbs)
Thickspike	6	20%	1.2
Slender Wheatgrass	6	10%	0.6
Western Wheatgrass	8	40%	3.2
Green Needlegrass	5	30%	1.5

Seed mix #1 shall be applied in upland areas.

- B. All seed shall comply with and be labeled in accordance with the Montana Seed Law. Seed shall have been grown in the North American Continent, in an area having climatic conditions and elevation similar to area of use. All seed should be of standard grade. The seed may be rejected by the Project Manager if the point of origin and production is not suitable.

1.8 SOIL MATERIALS

- A. Topsoil: Excavated from site and free of excess vegetation.

1.9 FERTILIZER

- A. Fertilizer: Recommended for native grass in proportions to meet requirements for actual nitrogen and phosphate as outlined in Section 2.4.A.
- B. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

PART 2 EXECUTION

2.1 EXAMINATION

- A. Verify substrate base has been contoured and compacted.
- B. If there is not enough topsoil for total area, the Engineer shall prioritize areas of topsoil.

2.2 SUBSTRATE PREPARATION

- A. Eliminate uneven areas and low spots.
- B. Remove debris, roots, branches, stones, in excess of 1 inch in size. Remove subsoil contaminated with petroleum products.
- C. Scarify subgrade to depth of 3 inches where topsoil is to be placed. Scarify in areas where equipment is used for hauling and spreading topsoil and has compacted subsoil.

2.3 PLACING TOPSOIL

- A. Place topsoil in disturbed areas to a nominal compacted depth of 1 inches. Place topsoil during dry weather.
- B. Fine grade topsoil eliminating rough or low areas. Maintain profiles and contour of subgrade.
- C. Remove roots, weeds, rocks and foreign material while spreading.
- D. Manually spread topsoil close to trees and plants to prevent damage.
- E. Lightly compact placed topsoil.
- F. Place excess topsoil on obliterated roadways.
- G. Leave stockpile area and site clean and raked, ready to receive landscaping.

2.4 FERTILIZING

- A. Fertilizer shall be evenly applied to native grass areas which are to receive seed at the rate of 30 pounds of actual nitrogen and phosphate per acre and worked lightly into the top one inch of soil in such a way as to make a finely pulverized seedbed approximately 48 hours prior to seeding. This operation may be accomplished by broadcast and hand raking or drilling with a fertilizer drill.
- B. Apply after smooth raking of topsoil.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- D. Lightly water to aid the dissipation of fertilizer.

2.5 SEEDING

- A. Grass seed shall be sown at the rate shown under Section 1.7 A.
- B. Planting Season: Fall, after August 15th or spring prior to May 15.
- C. Do not sow immediately following rain, when ground is too dry, or during windy periods. Wind speed should not exceed 5 mph.
- D. All disturbed areas shall be fertilized and seeded unless otherwise directed.

END OF SECTION